Subsequently, the tactile feedback is returned to the user using the tactile display **109-1** (Step **S14**), and then the reading of input data is continued (Step **S15**).

[**0338**] If the checking in Step **S12** results in negative, the designated GUI object is further checked if it has an additional information layer such as help, preview, or any other viewable item (Step **S16**). If there is the additional information layer, it is checked if the continuous control is possible with the gesture input (Step **S17**). If the continuous control is possible with the gesture input, the force F applied on the apparatus **100** or any other inputted gesture is mapped to the additional information layer to perform a predetermined action such as zooming in/out (Step **S18**). Subsequently, the tactile feedback is returned to the user using the tactile display **109-1** (Step **S19**), and then the reading of input data is continued (Step **S20**).

[**0339**] If the continuous control with the gesture input is not possible, the force F applied on the apparatus **100-1** is checked if it is greater than a predetermined threshold or if a level of the gesture input is greater than a predetermined level (Step **S21**). If the force F is greater than the predetermined threshold, the tactile feedback is provided to the user using the tactile display **109-1** (Step **S22**), and the additional information such as a pop-up help is displayed (Step **S23**). If the gesture input is not validated because of, for example, an insufficient value of the force F and failure to reach the predetermined threshold, the reading of input data is continued (Step **S24**). If the designated GUI object is determined to have no additional information in Step **S16**, the reading of input data is continued (Step **S25**).

[**0340**] As described above, the gesture input according to the present embodiment may be utilized for interactions for apparatuses of a hand-held type that do not use a mouse, touch display screen nor keyboard. For example, the present embodiment may be applicable to the following applications.

[**0341**] 1. Advanced remote control for a display screen.

[**0342**] 2. Advanced remote control for a TV receiver system (see **FIG. 27**).

[**0343**] 3. PDA (Personal Digital Assistance) and any other personal information monitor and management.

[**0344**] 4. Portable phone.

[**0345**] 5. Electronic book.

[**0346**] 6. Hand-held type game controller.

[**0347**] **FIG. 27** shows a schematic arrangement of a remote controller according to the present embodiment for an AV (Audio Visual) apparatus such as TV receiver, in which the gesture input is utilized. In the present example of **FIG. 27**, the user applies physical interaction on the remote controller so as to bend the main body thereof upward or downward. When the physical interaction (i.e., force or bend) is applied, an amount of bending, size or pattern of the force may be varied. The remote controller may decode such gesture and convert to data or a command for controlling the main apparatus such as the TV receiver, and the converted data or command is transmitted to the main apparatus.

[**0348**] As described above, according to the present embodiment, there is provided a portable information apparatus that allows the user to perform a complex input operation with rather simpler user actions.

[**0349**] Further, according to the present embodiment, there is provided a portable information apparatus provided with a physical user interface that accepts physical gestures of the user, thereby simplifying the input operation thereof.

[**0350**] According to the present embodiment, there is provided a portable information apparatus capable of transparently combining a plurality of gestures performed by the user and accepting these combined gestures as an input to the apparatus.

[**0351**] Further, according to the present embodiment, there is provided a portable information apparatus that can use physical interactions with the apparatus as a general-purpose interface to the apparatus.

[**0352**] According to the present embodiment, there is provided a computer interface capable of simultaneously interfacing the coordination input and the force input. Such capability of simultaneously accepting multi-dimensional user inputs promotes usability and provides more variations of interactions.

[**0353**] Such combination of the user inputs is advantageous, particularly for a hand-held type or portable type computers, and allows the user to perform a variety of interactions without using a mouse, touch display screen nor keyboard. Further, the interface according to the present embodiment does not interfere with a display screen, thereby the interaction gesture does not block any of display contents in the screen.

[**0354**] According to the interface of the present embodiment, the user may realize interactions regarding different orthogonal information with single gesture. The interactions based on the gestures are intuitive, effective and enjoyable.

[**0355**] According to the interface of the present embodiment, the user may transparently perform the two-dimensional coordination input and the force input at the same time on a small hand-held computer. For example, the single gesture may realize an interaction of scrolling a city map while simultaneously changing a scale of the map.

[**0356**] It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its intended advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

What is claimed is:

1. A user interface apparatus having a flexible part, comprising:

an analog sensor for sensing distortion of the flexible part, and

means for detecting one of a plurality of first-type input states based on a value of the distortion sensed by the analogue sensor and having a task run, the task being related to a selected first-type input state, wherein

at least one of the plurality of first-type input states is related to one of dynamic and static positive distortion of the flexible part,

at least one of the plurality of first-type input states is related to one of dynamic and static negative distortion of the flexible part, and